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IN H. C. Wood's Therapeutics it is affirmed that the absorption of the strontium salts and their elimination *appears* to be rapid, but the only exact chemical studies of the matter which I have been able to find are those of Laborde, Compte rendu de la Société de biologie, Paris, 9 s., 1890, vol. ii, pp. 453 and 708, and 1891, vol. iii, p. 562. In one of Laborde's experiments an amount of the strontium sulphate sufficient to represent 117 gm. of the metallic strontium was administered to a dog by the mouth in the course of 81 days, and the metal was found in the urine, fæces, bones, and liver. In a second experiment, the tartrate having been given in such quantity as to represent 453 gm. of the metallic strontium, that substance was again detected in the urine, bones, and liver, but was especially abundant in the fæces. In a third experiment, strontium phosphate representing 265 gm. of the metal was given in 111 days; in the urine and liver only unweighable traces were found, — from the bones was separated 0.63 gm. of the metal. Except in regard to the bones in the last experiment mentioned, Dr. Laborde does not report any amount of weighed metal obtained.

These experiments of Laborde do not prove that strontium is rapidly absorbed or eliminated, but only that it is absorbed to some extent and slowly rather than rapidly thrown off. For the purpose of obtaining more exact data I have made two experiments. The method of separating the strontium, for which I am indebted to Professor John Marshall, is as follows: —

"The urine and fæces were separately evaporated to dryness, and the residue incinerated until the organic matter was completely destroyed. The residue was warmed with nitric acid, the solution diluted with water, filtered, the filtrate nearly neutralized with ammonium hydroxide, and ammonium carbonate added in slight excess. The liquid was boiled, and the precipitate collected on a filter paper and thoroughly washed. The precipitate was then dissolved in just sufficient acetic acid to bring it into solution, and the solution then diluted with water. To remove phosphoric acid ferric

chloride was added and the solution nearly neutralized with sodium carbonate. The liquid was boiled, and filtered while hot to remove the triferric phosphate and basic ferric acetate which had separated. The filtrate was evaporated to dryness on a water-bath, and the residue repeatedly treated with nitric acid, evaporating the solution to dryness after each addition of nitric acid to convert the calcium and strontium present into nitrates. The dry residue was pulverized and treated with a mixture of strong alcohol and ether to separate calcium nitrate from strontium nitrate. The residue remaining after treatment with strong alcohol and ether was tested by means of the flame test for strontium, and wherever the quantity of residue remaining indicated a weighable quantity of strontium the residue was dissolved in a small quantity of water and the strontium precipitated by the addition of dilute sulphuric acid. In such cases the liquid was permitted to stand 12 hours, when the precipitate of strontium sulphate was collected on a filter paper, washed with a mixture of alcohol and ether, dried, incinerated, and weighed."

The first experiment was upon myself. In it I took by the mouth 3 grammes of strontium lactate ($Sr(C_3H_5O_3)_2$) representing 1.89 grammes of metallic strontium. The urine and fæces were collected separately for forty-eight hours. The result may be presented conveniently in a tabular form as follows: —

First day.

9 a. m.	Ingestion of 3 gm. strontium lactate.
10 a. m.	Urine contains a trace of Sr.
2 p. m.	" " " "
6 p. m.	" " " "

Second day.

9 a. m.	Fæces contain 0.0223 gm. metallic Sr.
2 p. m.	No strontium in urine.
10 p. m.	" " "

Third day.

9 a. m.	Fæces contain 0.1503 gm. metallic Sr.

Unfortunately the fæces were not saved after the third day, but it will be noted that during the forty-eight hours after the ingestion of an amount of strontium lactate representing 1.89 grammes of the strontium, 0.1706 gramme of the strontium was recovered from the fæces, equalling about 10 per cent of the amount ingested, whilst only a trace was found in the urine. This result is capable of several explanations; it is possible that the strontium is not absorbed and very slowly passes out from the alimentary canal, owing to its weight

causing it to cling to the mucous membranes; or it is possible that being more largely absorbed than is apparent it is eliminated with great slowness. The latter conclusion, however, is highly improbable in the face of the fact that the strontium disappeared from the urine within twenty-four hours. If absorption and retention were the case, certainly there should have been as much strontium in the urine on the second as on the first day. It is of course possible that the discharge of strontium with the fæces may have depended upon an elimination of absorbed strontium by the intestinal mucous membrane.

To determine whether such elimination occurs to any extent a second experiment was made. In this a small dog was given a hypodermic injection of 3 grammes of strontium lactate, dissolved in water. The urine and fæces were separately collected for 72 hours, and carefully examined by the process previously given, but no strontium was detected.

The experiment just recorded shows that strontium given hypodermically, if absorbed at all, is only eliminated with the greatest slowness; and demonstrates that the strontium which was passed from the bowel in the first experiment had not been eliminated from the bowel but had remained unabsorbed. As suggested by Professor Marshall, it is probable that when the strontium salt is taken by the mouth absorption takes place to some extent in the stomach, but that that portion of the salt which escapes into the intestines is converted into an insoluble phosphate. It is also probable that the alkaline juice of the tissues largely breaks up the strontium salt, so that absorption from the cellular tissue is a very slow process. It is a further plausible conclusion that the strontium salts taken into the intestines, like the bismuth salts, are so very slowly absorbed that they exert a persistent local influence; an experimental conclusion which is in accord with the clinical fact which has been insisted upon especially by Professor H. C. Wood, that the strontium salts have a marked influence upon the digestive processes in the intestinal canal.

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